Docket No.: 4284-0102PUS1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Giancarlo BRUN

Application No.: NEW

Confirmation No.:

Filed: December 20, 2005

Art Unit: N/A

For: ROLLING SCREW WITH SMALLER ADVANCE PER TURN THAN THE PITCH OF THE THREADING

Examiner: Not Yet Assigned

LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The PTO is requested to use the amended sheets/claims attached hereto (which correspond to Article 19 amendments or to claims attached to the International Preliminary Examination Report (Article 34)) during prosecution of the above-identified national phase PCT application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §1.16 or 1.14; particularly, extension of time fees.

Application No.: NEW

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Dated: December 20, 2005

Respectfully submitted,

By _____
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Attachment(s)

AMENDED CLAIMS
[received by the International Bureau on 01 February 2005 (01.02.2005);
original claims 1-24 replaced by amended claims 1-23 (5 pages)]

Claims:

1. ROLLING SCREW WITH SMALLER ADVANCE PER TURN THAN THE PITCH OF THE THREADING, where a threaded coupling is foreseen in which a screw is turned inside one or more female screws (inserted in a single body or sleeve) and where the pitch of the thread of said female screws is equal to that of the screw whereas the nominal diameter is greater than that of the screw itself, each of the female screws consisting of a bearing, able to simultaneously bear both radial and axial loads, with an inner ring that has the threaded hole and where the axis of said female screws is parallel, but not coinciding, with the axis of the screw; in such a way, the contact between the thread of the screw and the thread of each of the female screws is realised, approximately at the generating line of the respective cylindrical surfaces, the device being characterised in that the screw and the female screw are equipped with syncronised movement, realised with any type of per se known syncronisation device.
2. ROLLING SCREW, according to claim 1, characterised in that the threaded inner hole of the female screw is formed on a bush which, in turn, is fitted onto the inner ring of at least one bearing.
3. ROLLING SCREW, according to claims 1 and 2, characterised in that the female screws are not arranged coaxial to each other.
4. ROLLING SCREW, according to claim 1, characterised in that the screw (1) is inserted inside the sleeve (2), made up of two half-shells (2a, 2b), kept joined together through mobile connection members (3) in the sleeve (2), near to the two bases, with the guide bearings (4) being inserted, kept locked by the elastic rings (5); the screw itself is inserted (but free to slide) on said bearings and in the central zone of the sleeve (2) a bearing (6) is mounted, of

the type suitable for bearing axial loads, which has its inner ring (7) with a threaded hole coupled with the screw itself, said bearing (6), with a threaded hole, being mounted eccentrically with respect to the axis of the screw (1) and with respect to the axis of the two guide bearings (4) of the screw itself, with it being foreseen that the threads of the screw (1) and the threads of the female screw, formed on the inner ring (7), come into contact with each other approximately along a generatrix of the threaded surface and not on the whole surface of the thread itself, with the rotation of the screw (1) about its own axis, the threaded inner ring (7) of the central bearing (6) also being made to rotate in the same direction as that of the aforementioned screw.

5. ROLLING SCREW, according to one or more of the previous claims, characterised in that the screw (1) is idle, whereas the threaded ring (7), applied to the female screw, is placed in rotation through a transmission system, which uses per se known means, such as belts and gears.
6. ROLLING SCREW, according to one or more of the previous claims, characterised in that the screw (1) is fixed, whereas the entire sleeve (2) is placed in rotation, through a transmission system, which uses per se known means, such as belts and gears.
7. ROLLING SCREW, according to one or more of the previous claims, characterised in that the use of two or more female screws contained inside the sleeve itself is foreseen.
8. ROLLING SCREW, according to one or more of the previous claims, characterised in that it is foreseen for there to be an absence of guide bearing inside the sleeve.
9. ROLLING SCREW, according to one or more of the previous claims, characterised in that it is foreseen that the female screws consist of

internally threaded bushes fitted in the hole of at least one of the sliding or rolling bearings contained in the sleeve.

10. ROLLING SCREW, according to one or more of the previous claims, characterised in that it is foreseen that a preload is applied on the screw, to realise an extremely precise movement and positioning of the rotating members to zero the tolerance clearance.

11. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees the application of a locking/unlocking system of the rotation of the bearing or of the bearings of the female screw to obtain, when the aforementioned bearings are locked, an advance per turn of the screw equal to the value of the pitch of its thread.

12. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees the application of a locking/unlocking system of the rotation of the screw to obtain, when it is locked, an advance per turn of the sleeve of a value equal to the pitch of the thread of the aforementioned screw.

13. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees the use of a "free-wheel" type device, which prevents the rotation of the bearing of the female screw in one of the two directions.

14. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees the use of a "free-wheal" type device, which prevents the rotation of the screw in one of the two directions.

15. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees a plurality of female screws that have diameters of different values.

16. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees that the female screws are

susceptible to being placed in a condition not in contact with the screw, indipendently from each other.

17. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees that from the plurality of female screws, with different diameters, only a selected one can remain in contact with the screw, so as to obtain an advance per turn of the screw dependent upon the diameter of the specific female screw being used.
18. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees that the diameters of each of the female screws have a value such than when all of the aforementioned female screws are in the condition of detachment from the screw it is possible to make the screw slide freely on the guide bearings.
19. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees that the female screw is equipped with circumferential throats and with advance per turn equal to the threading value of the screw.
20. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees that the screw is equipped with circumferential throats and with advance per turn equal to the threading pitch of the female screw.
21. ROLLING SCREW, according to one or more of the previous claims, characterised in that it foresees that one or more female screws are replaced with externally threaded bearings.
22. ROLLING SCREW, according to claim 21, characterised in that it foresees that the externally threaded bearings are placed in contact with the screw, to obtain advances per turn of a greater value with respect to the pitch of the threading of the screw itself.

23. ROLLING SCREW, according to one or more of the previous claims, characterised in that it is actuated through the use of a motor reducer with low transmission ratio, therefore reversible and, in situations of failure or lack of energy, even able to be actuaded manually.